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REMARKS

Claims 1-17 are pending in this application. Claims 1-5, 10 and 12-17 are rejected under 35 USC 103(a) as being unpatentable over Wolfla in view of Middelman. Claims 16 and 17 are rejected under 35 USC 103(a) as being unpatentable over Wolfla in view of Middelman and further in view of Schienle. Claims 6-9 are rejected under 35 USC 103(a) as being unpatentable over Wolfla in view of Middelman and further in view of JP2001144339A. Claim 11 is rejected under 35 USC 103(a) as being unpatentable over Wolfla in view of Middelman and further in view of Cantello.

The applicants appreciate the Examiner's explanation of his interpretation of Wolfla, since it enables the applicants to understand the Examiner's position and to provide the following remarks that should be helpful in resolving the differing interpretations of the teaching of Wolfla.

The Examiner interprets Wolfla as pertaining to the cutting of a gap into a ceramic material because Wolfla refers to U.S. patent 4,291,089. The Examiner states that the '089 patent describes forming seals with a spray powder which "usually" contains metal in addition to the non-metal core. The Examiner interprets the word "usually" as meaning that the '089 patent encompasses spray powders which do not necessarily contain metal. However, a closer reading of that section of the '089 patent (column 1, lines 38-43) shows that the word "usually" is used to mean that the powder does not necessarily contain a second material to provide abrasability. The pertinent sentence of the '089 patent is quoted as follows:

"Powders used to form abrasable seal coatings usually include a metallic material to provide sprayability, structural strength and erosion resistance, and a non-metallic solid material to directly or indirectly provide structural weakness, that is to say abrasability, in the seal coating."

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This sentence means that the powders "usually" include two things: a metallic material to provide sprayability, strength and erosion resistance and a second material to provide abrasability (in this instance a non-metallic solid material). However, other options in the "unusual" situation may still include the metallic material, but may not include the second material to provide abrasability. For example, United States patent 4,664,973 describes a metal abrasable seal material where the abrasability is provided by pores that are formed in the metal by the evaporation of a fugitive polymer material. Thus, when the '089 patent says that the powder used to make the seal "usually" includes a metallic material and a non-metallic solid material, it should be interpreted to suggest that "unusual" metallic seal materials may not include the non-metallic solid material, but rather may provide abrasability in some other fashion. Thus, the word "usually" in the '089 patent does not provide a basis for the Examiner's suggestion that the seal material of Wolfla may be non-metallic. Accordingly, the cited prior art of Wolfla does not support the rejections under 35 USC 103, and the rejections of all claims should be withdrawn.

Moreover, the '089 patent and the Wolfla patent are directed to abrasable seal coatings. The field of abrasable seal coatings provides no teaching or suggestion relevant to the claimed improved methods of manufacturing of a ceramic insulating material, since seal materials are well known to require mechanical properties (such as abrasability) that are very different from those required of ceramic insulating materials. Thus, even if Wolfla were mistakenly interpreted as describing a ceramic seal material, it would not provide support for the rejections under 35 USC 103.

With regard to the rejection of claims 6-9, the applicants note that the Japanese reference JP2001144339A teaches away from the present invention, as explained in more detail as follows.

Looking first to claim 6, note that the Japanese reference teaches away from the present invention because it illustrates a plurality of grooves that are all the same depth (see grooves 3 of FIG. 2). The grooves are described in the Abstract as being "narrow and deep", but they are all illustrated in FIG. 2 as being of the same depth. While it is not completely clear from the limited English Abstract, it appears that these grooves 3 are filled in with metal 7 (FIG. 5), then a second set of grooves is formed

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from the opposing surface of the device. These second grooves are also all of equal depth. The second grooves are not formed until the first set of grooves are filled with metal, and they are formed from an opposing surface, thus there is no teaching of two sets of grooves of different depths in a top surface, as is required in present claim 6. Claim 6 is presently amended to clarify that the first and second depths are different and they are both formed in the top surface.

Looking now to claim 7 and its dependent claims 8 and 9, there is no suggestion that the Japanese reference describes a process for forming the grooves that requires two passes of laser energy with differing parameters. In contrast, claim 7 includes the limitations of differing laser energy parameters for the first and second passes of the laser energy.

Thus, the limitations of claims 6-9 provide additional basis for novelty and nonobviousness.

With regard to the rejection of claim 12, the Examiner has provided no *prima facie* case for obviousness, since none of the cited references teach or suggest the claim 12 limitations of "forming the continuous gap to follow a direction of a fluid stream over the top surface when the component is in use." The Examiner does not address this claim in his comments in the Office Communication. If the Examiner disagrees with the applicants' position regarding this claim, a citation to a specific prior art page/line/figure number is respectfully requested. The applicants believe that the limitations of claim 12 provide an additional basis for novelty and nonobviousness.

Finally, with regard to the rejection of claims 16 and 17, the applicants note that Schienle describes the use of grooves on a substrate surface in order to enhance the adhesion of a coating layer. (column 3, lines 9-10) Schienle fails to teach or describe the use of grooves as a stress relieving mechanism between two layers. The addition of Schienle to Wolfla and Middelmann results only in the addition of grooves to the substrate in order to increase the adhesion of the coating layer. The Examiner suggests that mid-depth grooves would be obvious "depending on the degree of build up desired for building a seal." However, such materials are normally thermally deposited to any desired depth without the need for a multi-layer coating, therefore, there would be no motivation to stop a deposition process in mid-depth to add

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grooves, since this would only serve to weaken the layer and to increase manufacturing costs. Furthermore, the addition of a mid-depth layer of grooves would be detrimental for the seal applications of Wolfla and Middelman, since it would create a preferential failure plane that would weaken the seal when exposed to shearing forces by an opposed abrading surface. Furthermore, there is no teaching or suggestion in the art to support the Examiner's hindsight proposition that a first grooved layer would be rebuilt with a second top layer, since seal materials are typically not rebuilt in this manner, and any worn seal would not have surviving grooves in its topmost surface. Thus, the limitations of claims 16 and 17 provide additional basis for novelty and nonobviousness.

New claim 36 is added to depend from claim 16 and to include the limitations of "wherein the first plurality of continuous gaps serves to define a preferential failure interface between the layers of ceramic insulating material, and further comprising depositing the second layer of ceramic insulating material to a critical depth selected to allow the insulation to spall along the preferential failure interface in response to an expected thermal transient in order to present a fresh layer of the ceramic insulating material to a surrounding high temperature environment." Nothing in the cited prior art teaches or suggests such limitations, and claim 36 is believed to be in condition for allowance.

Reconsideration of the amended application in light of the above Remarks and allowance of claims 1-17 and 36 are respectfully requested. The Examiner is welcomed to call the undersigned attorney should he believe that a telephone conference would be helpful in resolving any further objections to the application.

Respectfully submitted,



David G. Maire (Reg. No. 34,865)

Beusse Wolter Sanks Mora & Maire, P.A.
390 North Orange Ave., Suite 2500
Orlando, FL 32801
Telephone: 407-926-7704